RISC Computing Platforms

Demand Greater Miniaturization for Applications

- RTX Modules
- SMARC Modules
- Qseven Modules
- 3.5" Single Board Computers
- Box Computers
- RISC Design-in Support Services
- RISC Software Support Services

ARM freescale Texas Instruments

Windows Embedded android Linux

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Collaborating for RISC Business Opportunities

The RISC Market is Booming...

With the movement towards the intelligent city, the increasing demand for diverse embedded applications has progressed along many different avenues. More and more smart node devices will be needed in the intelligent city. This represents a huge market opportunity for RISC devices, because power consumption requirements will always be a top priority, and due to the complexities of deployment, small size and stable performance are vital. RISC will be at the bottom layer of the intelligent city network, and the last mile technology to complete cross interface communication and computing capabilities. Therefore, it can be confidently predicted that the new business opportunities will be limitless.

To keep up with these opportunities, Advantech is committed to meeting the growing demand in RISC-based computing, to implementing RISC-based architectures, and to continuously developing RISC-based industrial computing platforms that enable the intelligent city. Advantech also provides a RISC Core Architecture for customers to start from the HW layer, IC/Chip vendor, firmware, OS, driver, codec and framework to user/customer applications. We build from this Core architecture to implement our solutions for customers to improve time-to-market and reduce design cost.

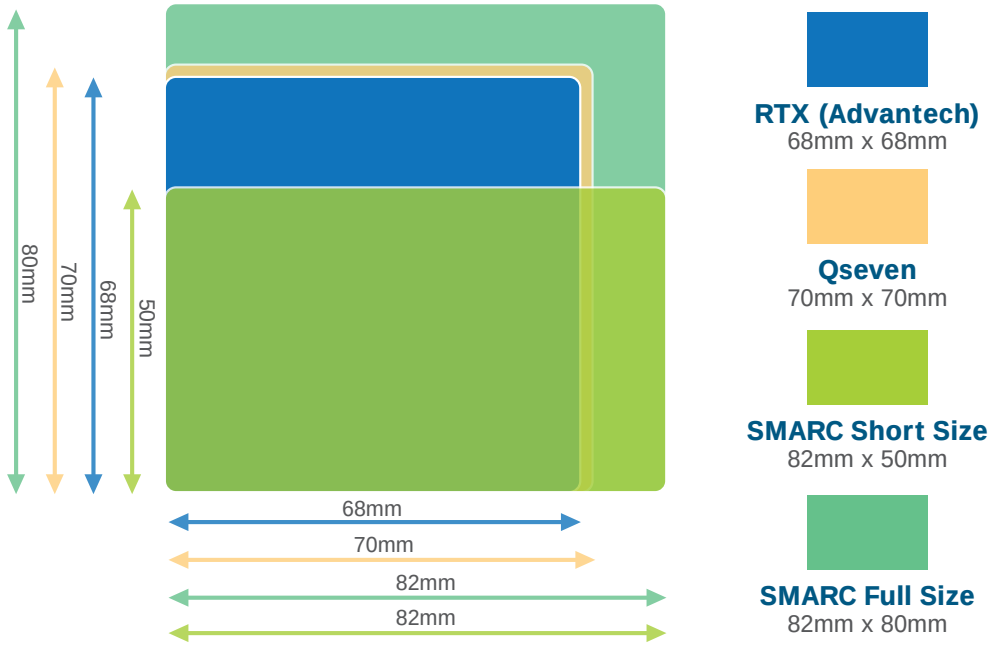
Advantech RISC Computing Platforms

Advantech RISC computing platforms provide a standardized, ultra compact yet highly integrated computing solution that can be utilized across multiple embedded PC, system and appliance designs. Our RISC computing platforms can meet the requirements for power-optimized mobile devices and performance-optimized consumer applications. We developed RISC Computer-on-Modules, Single Board Computers and Box Computers based on the ARM processor technologies. Together with RISC Design Support Services they streamline the whole design process and help customers rapidly develop their own innovations in industrial control, portable device, home automation, medical device, HMI/kiosk, robotics and transportation segments.

With a Full Range of Form Factors

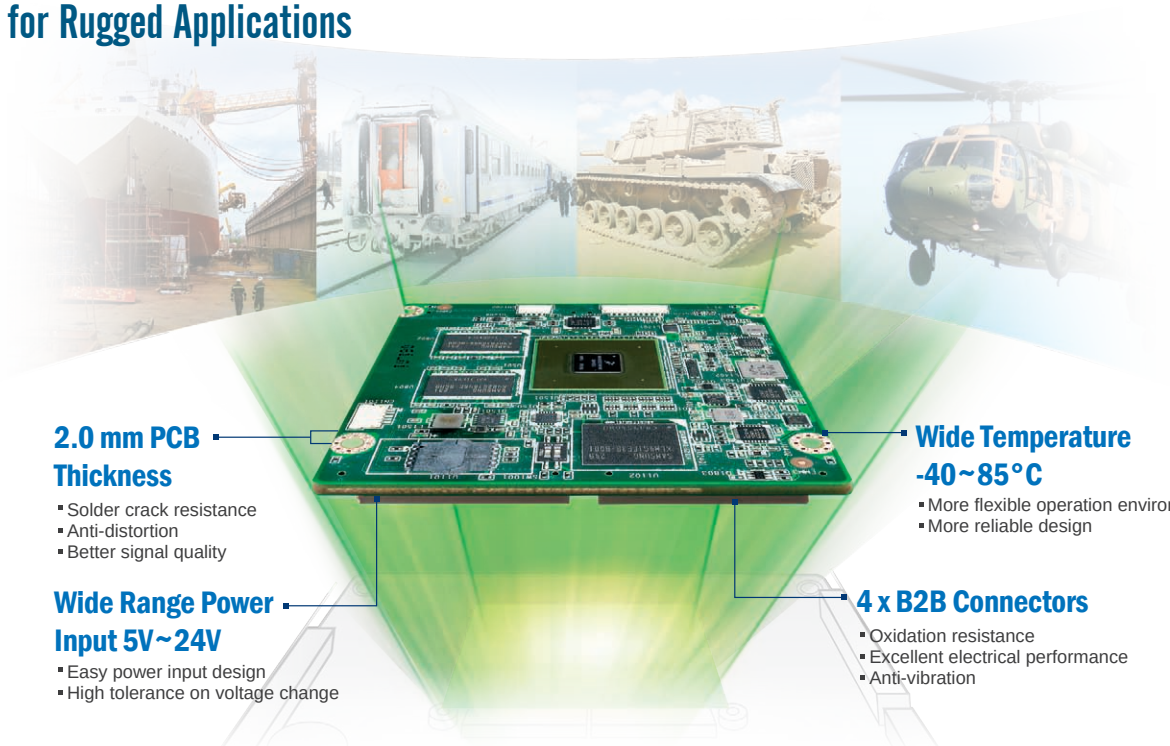
Advantech joined the SGET consortium to contribute to defining the SMARC and Qseven form factors, and proposing new specifications of the RTX (RISC Technology eXtended) for rugged applications and UBC (Ubiquitous Computer) to meet demands across vertical markets. Advantech provides complete solutions that let customers take worry-free advantage of RISC-based platforms.

Modular Form Factor Introduction



Advantech RTX (RISC Technology eXtended) Module

for Rugged Applications



2.0 mm PCB Thickness
- Solder crack resistance
- Anti-distortion
- Better signal quality

Wide Range Power Input 5V~24V
- Easy power input design
- High tolerance on voltage change

Wide Temperature -40~85°C
- More flexible operation environment
- More reliable design

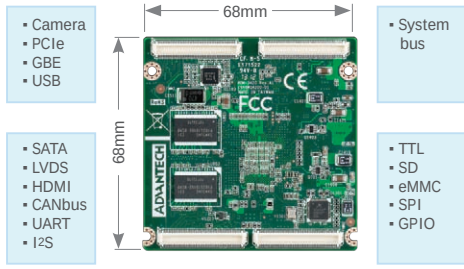
4 x B2B Connectors
- Oxidation resistance
- Excellent electrical performance
- Anti-vibration

In order to make up for deficiencies in Qseven and SMARC based products, Advantech introduced the RTX 2.0 (RISC Technology eXtended) specification which is a RISC standard platform designed for rugged applications. Through its innovative mechanical and electrical design, products designed with RTX 2.0 can perform in complex and challenging environments such as military, logistics, transportation/fleet management, and many other industrial applications.

Comparison Table

Platform	Qseven 2.0	SMARC 1.0	RTX 2.0
Connector	MXM 2.0	MXM 3.0	MATSUSHITA B2B
Pin count	230	314	400
Application	Portable	Portable	Ruggedized
PCB thickness	1.2mm	1.2mm	2.0mm
Connector mating force	55~60N	55~60N	98N
Connector operating temperature range	0~85°C	0~85°C	-40~85°C

RTX 2.0 Pin Assignments

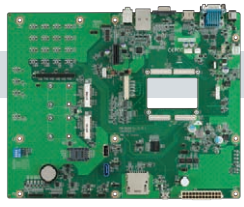


Product Highlights

ROM-3420

Freescale ARM Cortex-A9 i.MX6 RTX2.0 Module

- Freescale ARM Cortex-A9 i.MX6 Dual 1 GHz high performance processor
- Onboard DDR3 1 GB memory / 4 GB Flash
- Supports wide range power input 5V~24V
- Supports OpenGL ES 2.0 and OpenVG 1.1 hardware accelerators
- Supports full HD 1080p video decode and HD 1080p video encode hardware engine
- Supports 1 PCIe, 1 GbE, 1 USB 2.0 , 1 USB OTG2.0 , 1 SATAII, 4 I2C , 1 I2S, 1 Camera in, 2 CANbus , 10 GPIO, System bus



ROM-DB3900

Development board for RISC RTX2.0 Module

- 3 display outputs. VGA, HDMI, 24-bit LVDS
- 1 SATA/SATA-DOM, 1 RJ-45, 2 USB 2.0, 2 CAN bus, 4 UART, 10 GPIO
- 2 PCIe slots
- 2 MIPI interfaces for camera module
- Onboard eMMC Flash 4 GB, SD card, SIM card slot

SMARC Module

for Portable Applications

Advantech joined the SGET consortium to contribute to defining the SMARC form factor. The new global standard under the brand name SMARC (Smart Mobility ARChitecture) is based on ULP-COM, a term which up to now was used for Ultra Low Power Computer-on-Modules. It optimized module designs in three ways:

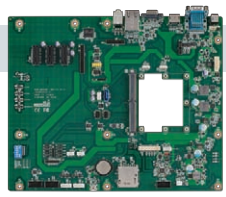
- Optimized pin-out definition for RISC/ARM
- Easy H/W design for lithium-ion battery
- Slim and low-profile module outline

Product Highlights

ROM-5420

Freescale ARM Cortex-A9 i.MX6 SMARC Module

- Freescale ARM Cortex-A9 i.MX6 Dual 1 GHz high performance processor
- Onboard DDR3 1GB
- Parallel RGB, HDMI, Single channel 24bit LVDS, 1366 x 768
- Supports 4 GB eMMC Flash, 1 SD/MMC, 1 SATA
- 2 CAN, 4 UART, 1 I2C, 12 GPIO, 1 PCIe, 1 camera input and 1 Giga LAN
- Supports OpenGL ES 2.0 and OpenVG 1.1 hardware accelerators
- Supports full HD hardware encode/decode engine
- Supports image protection



ROM-DB5900

Development board for RISC SMARC Module

- 3 display outputs. VGA, HDMI, 24-bit LVDS
- 1 SATA/SATA-DOM, 1 RJ-45, 2 USB 2.0, 2 CAN bus, 4 UART, 12 GPIO
- 3 PCIe x1 slots
- 2 MIPI interfaces for camera module
- Onboard eMMC Flash 4 GB, SD card slot
- Supports HD Audio codec and SPDIF
- Supports 2 types of power input

Qseven Module

for Mobile Applications

The Qseven concept is an off-the-shelf, multi vendor, Computer-On-Module that integrates all the core components of a common PC and is mounted onto an application specific carrier board. Qseven modules have a standardized form factor of 70mm x 70mm and have specified pinouts based on the high speed MXM system connector that has a standardized pinout regardless of the vendor. The Qseven module provides the functional requirements for an embedded application. These functions include, but are not limited to, graphics, sound, mass storage, network and multiple USB ports. A single ruggedized MXM connector provides the carrier board interface to carry all the I/O signals to and from the Qseven module.

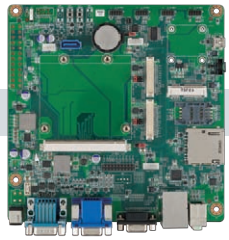
- Low Cost
- Low Power Consumption
- Legacy Free
- Fast Serial Interfaces

Product Highlights

ROM-7420

Freescale ARM Cortex-A9 i.MX6 QSeven Module

- Freescale ARM Cortex-A9 i.MX6 Dual 1 GHz high performance processor
- Onboard DDR3 memory 1 GB
- Onboard eMMC NAND Flash 4 GB
- Supports OpenGL ES 2.0 and OpenVG 1.1 hardware accelerators, full HD 1080p video codec
- VGA, HDMI, 24-bit LVDS
- 2 CAN, 4 UART, 3 I2C, 8 GPIO
- 2 USB, 1 SD/MMC
- 1 Giga LAN; 1 PCIe x1 Gen2
- Optional thermal solution



ROM-DB7500

Development board for RISC Qseven Module

- Support VGA, HDMI and 2 24-bit LVDS
- Supports 1 PCIe x1
- Supports 1 SATA, 4 UART, 1 RJ-45, 4 USB 2.0, 1 GPIO connector
- HD Audio Codec
- Supports dual CAN bus
- Onboard SD card slot, SIM card slot

Full Performance Signage Player

for Digital Signage

RISC-based Box Computer UBC(Ubiquitous Computer) series is designed to meet demands across vertical markets. UBC-DS31 is a RISC-based signage box powered by Freescale i.MX6 ultra low power processor with on-board DDR3 and eMMC. With maximum power consumption under 3 Watts, it still delivers superior multimedia performance and a Full HD 1080p hardware video codec engine. It also features an easy-assembly design, specific management software for digital signage applications, and built-in Giga LAN. UBC-DS31 is a function-integrated and cost effective solution for digital signage applications.

Easy Assembly

- Supports wall mount and VESA 75/100 mount
- Provides flexible wall mounting holes

Full Performance

- Full HD video playback engine
- Supports dual display (VGA & HDMI)
- Ultra low power consumption

Easy Maintenance

- Latch lock, screw-less dismantle
- Special design for cable strong fixed
- SD & SIM card protection

Easy Management

- Built-in SUSIAccess for signage software
- Supports content produce and device conduct
- Remote control management

Product Highlights

UBC-DS31

Freescale ARM Cortex-A9 i.MX6 Signage Player

- Freescale ARM Cortex-A9 i.MX6 dual 1.0GHz
- On-board DDR3 1 GB & 4 GB Flash
- Supports Full HD 1080P H/W video codec engine
- Networking Giga LAN capability
- Support Linux and Android players and BSP
- Friendly mounting mechanism
- Supports 1 UART, audio out and reset button

Software Support Services

SUSIAccess for Signage

- Built-in SUSIAccess for Signage based on Linux QT framework.
- Supports Content Producer and Device Conductor for remote management
- Supports Linux BSP for customers to develop specific signage application software

Andorid U-Poster

- Remote device management for Android
- Build-in FTP server and Dropbox support
- Easy customization for layout editor
- Fancy Android widget

IP-based Box Computer

for Edge Computing

UBC-200 is an IP-based RISC compact box for edge computing. With powerful ARM Freescale i.MX6 Cortex-A9 Dual/Quad core processor inside, UBC-200 is the best choice to fulfill requirements of CPU performance and power consumption. It supports USB 2.0, HDMI up to 1080p, and Giga LAN, as well as mini PCIe for Wi-Fi/3G modules and a SD card for storage expansion. With the wall mount brackets and Din-rail enclosed in UBC-200 mounting kit, you can easily install it on a wall or sliding rail.

Cross Interface Communication

- IP connection
- Capable common protocol
- Giga LAN/ Wi-Fi/ 3G networking

Intelligent Classification

- Smart node
- IP-based

Reliable Design

- Wide temperature -20~70°C
- Wide range power input 9V~24V
- Metal chassis

Compact but Functionality

- Compact size 110x77x30mm, 315g
- High performance Cortex-A9 dual/quad core with low power consumption 3W
- 2D/3D graphic engine supports Full HD 1080P

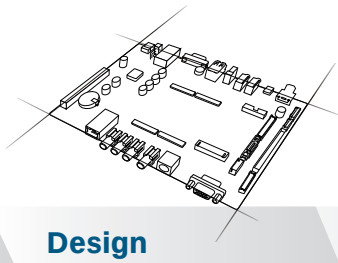
Product Highlights

UBC-200 **Freescale ARM Cortex-A9 i.MX6 Box Computer**

- Freescale ARM Cortex-A9 i.MX6 Dual/Quad 1 GHz high performance processor
- Onboard DDR3 1 GB, up to 2 GB
- On board 4 GB eMMC Flash
- Supports OpenGL ES 2.0 and OpenVG 1.1 hardware accelerators, full HD 1080p video codec
- HDMI 1920x1080
- 1 USB 2.0, 1 10/100/1000 Mbps Ethernet; 1 SD card slot
- On board mini-PCIe connector for Wi-Fi/3G module support
- Low power, fanless design
- Supports wall mount and Din-rail

RISC Design-in Support Services

Advantech developed RISC ARM-based Computer-on-Modules and Single Board Computers together with RISC Design-in Support Services. We have worked out a valuable development process for modular designs that includes planning, design, integration, and validation phases; it streamlines the whole design procedure and helps customers rapidly develop innovations that differentiate them from their competitors.



Planning

- Consultant services suggest appropriate solutions considering technical trends, specs and schedule
- Offer suitable evaluation kit(s) for customer evaluation

Design

- Technical documents for optimizing layout/schematics
- Referenced schematics to speed up development of carrier board
- BSP ready for AP development
- Customer's carrier board schematic review

Integration

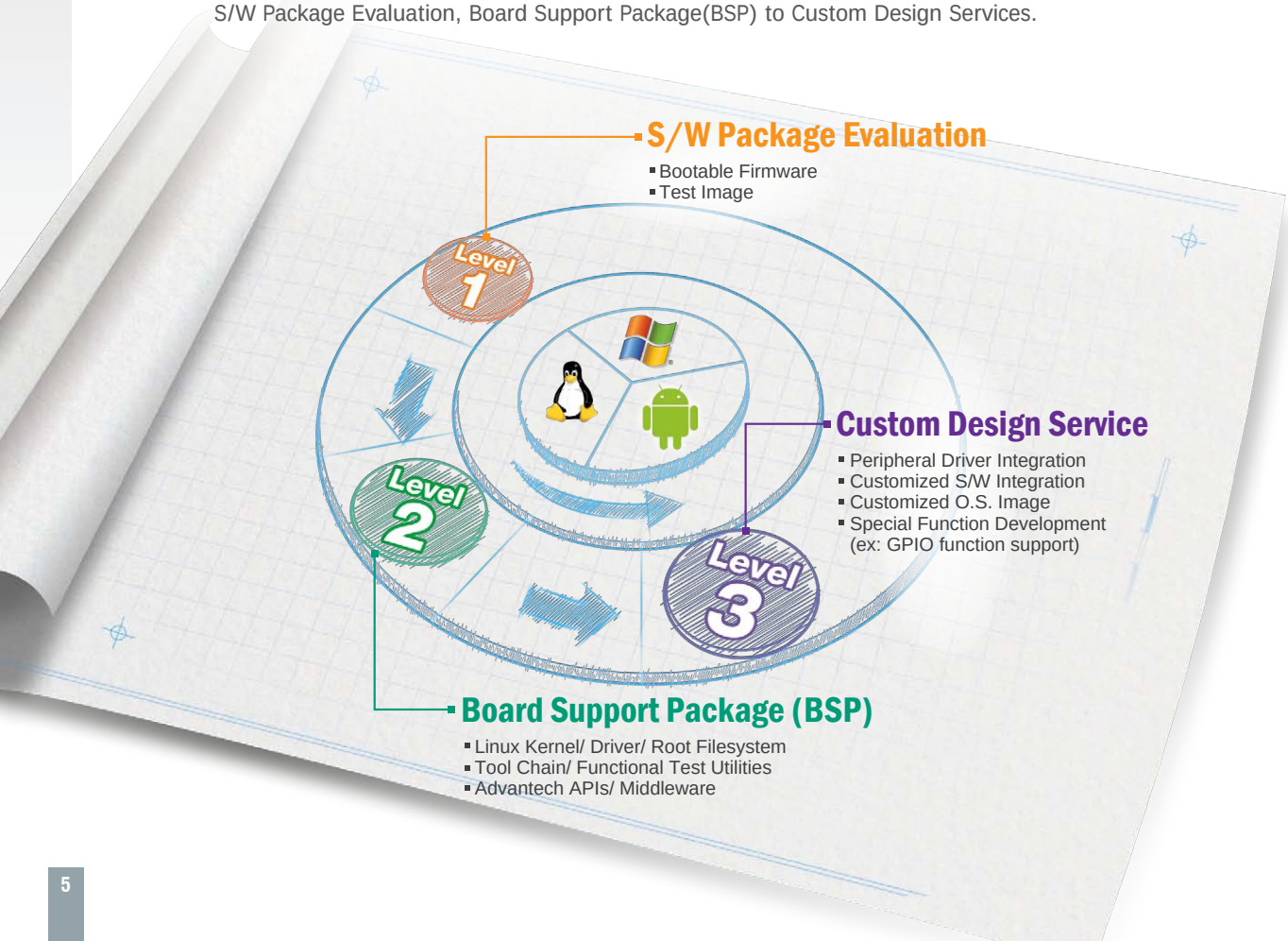
- Board level integration support
- Peripheral module integration
- Consult for HW/SW fine-tuning
- SW customization services
- Optional thermal solution for system integration

Validation

- Test tools ready to validate customer's solution
- Consultant services for HW/SW related issues
- Test sample validation-Production run confirmation

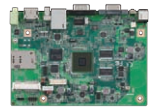
RISC Software Support Services

Advantech has integrated RISC hardware with software to produce ready-to-run, RISC-based platforms that help customers reduce development time and design costs. We offer three levels of software services: from S/W Package Evaluation, Board Support Package(BSP) to Custom Design Services.



RISC Computing Platforms



Model Name		ROM-3420	ROM-5420	ROM-7420	RSB-4410
Form Factor		RTX2.0	SMARC	Qseven	3.5" SBC
Processor System	CPU	Freescale ARM Cortex-A9 i.MX6 Dual 1 GHz	Freescale ARM Cortex-A9 i.MX6 Dual 1 GHz	Freescale ARM Cortex-A9 i.MX6 Dual 1 GHz	Freescale ARM Cortex-A9 i.MX6 Dual 1 GHz
Memory	Technology	DDR3 1066 MHz	DDR3 1066 MHz	DDR3 1066 MHz	DDR3 1066 MHz
	Capacity	On-board DDR3 1 GB	On-board DDR3 1 GB	On-board DDR3 1 GB	On-board DDR3 1 GB
	Flash	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader
Graphics	LVDS	1 Single 24-bit LVDS, 1366 x768	1 Single 24-bit LVDS, 1366 x 768	2 24-bit LVDS, 1366 x 768 for 1ch; 1920x1200 for 2ch	1 x 18/24-bit LVDS
	HDMI	1920 x 1080	1920 x 1080	1920 x 1080	1920 x 1080
	Parallel RGB	1 24-bit TTL, 2048 x 1536	1 24-bit TTL, 2048 x 1536	-	-
	VGA	-	-	1920 x 1080	1920 x 1080
	Graphics Engine	3 GPUs. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1	3 GPUs. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1	3 GPUs. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1	3 GPUs. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1
	H/W Video Codec	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP, MJPEG BP Encoder: MPEG-4 SP, H.264 BP, H.263, MJPEG BP	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP, MJPEG BP Encoder: MPEG-4 SP, H.264 BP, H.263, MJPEG BP	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP, MJPEG BP Encoder: MPEG-4 SP, H.264 BP, H.263, MJPEG BP	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP, MJPEG BP Encoder: MPEG-4 SP, H.264 BP, H.263, MJPEG BP
Ethernet	Chipset	Freescale i.MX6 integrated RGMII	Freescale i.MX6 integrated RGMII	Freescale i.MX6 integrated RGMII	Freescale i.MX6 integrated RGMII
	Speed	1 x 10/100/1000 Mbps	1 x 10/100/1000 Mbps	1 x 10/100/1000 Mbps	1 x 10/100/1000 Mbps
RTC		Yes	Yes	Yes	Yes
WatchDog Timer		256-level timer interval, from 0 ~ 128 sec	256-level timer interval, from 0 ~ 128 sec	256-level timer interval, from 0 ~ 128 sec	256-level timer interval, from 0 ~ 128 sec
I/O	PCIe	1 PCIe x 1 Lane	1 PCIe x 1 Lane	1 PCIe x 1 Lane	1 PCIe x 1 Lane
	SATA	1 SATA II	1 SATA II	-	-
	USB	1 USB 2.0, 1 USB 2.0 OTG	1 USB 2.0, 1 USB 2.0 OTG	1 USB 2.0, 1 USB 2.0 OTG	1 USB 2.0, 2 USB pin header
	Audio	I^2S	I^2S	I^2S	1 x Line-out
	SPDIF	-	1	-	-
	SDIO	1	1	1	1
	Serial Port	3 UART (3 x 4 wire w/ 3.3V)	4 UART (2 x 2 wire, 2 x 4 wire w/ 3.3V)	4 UART (4 x 2 wire w/ 3.3V)	3 UART (2 x 2 wire, 1x 4 wire w/ 3.3V)
	SPI	1	5	1	-
	CAN	2 x CAN bus 2.0B	2 x CAN bus 2.0B	2 x CAN bus 2.0B	-
	GPIO	10	12	8	-
	I^2C	4	1	3	-
	Camera Input	1 MIPI/CSI-2, supporting from 80 Mbps up to 1 Gbps speed per data lane	1 MIPI/CSI-2, supporting from 80 Mbps up to 1 Gbps speed per data lane	-	-
	System Bus	Address : 31 pins Data : 16 pins	-	-	-
	Touch	-	-	-	-
	Keypad	-	-	-	-
Power	Power Supply Voltage	5 ~ 24 V	3 ~ 5.25 V	5 V	12V
	Power Consumption	TBD	TBD	2.67W	3.9W
Environment	Operational Temperature	0 ~ 60° C/ -40 ~ 85° C	0 ~ 60° C/ -40 ~ 85° C	0 ~ 60° C	0 ~ 60° C
	Operating Humidity	0% ~ 90% relative humidity, non-condensing	0% ~ 90% relative humidity, non-condensing	0% ~ 90% relative humidity, non-condensing	5%~95% Relative Humidity,non-condensing
Mechanical	Dimensions (W x D)	68 x 68 mm	82 x 50 mm	70 x 70 mm	146 x 102 x 20 mm
Operating System		Linux Kernel v3.0.35	Linux Kernel v3.0.35	Linux Kernel v3.0.35	Linux Kernel v3.0.35
Certifications		CE/FCC Class B	CE/FCC Class B	CE/FCC Class B	CE/FCC Class B


Model Name		UBC-DS31	UBC-200
Form Factor		Signage Player	Box Computer
Processor System	CPU	Freescale ARM Cortex-A9 i.MX6 Dual 1 GHz	Freescale ARM Cortex-A9 i.MX6 Dual/Quad 1 GHz
Memory	Technology	DDR3 1066 MHz	DDR3 1066 MHz
	Capacity	On-board DDR3 1 GB	On-board DDR3, up to 2 GB
	Flash	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader
Graphics	HDMI	1	1
	VGA	1	-
	Graphics Engine	3 GPUs. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1	3 GPUs. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1
	H/W Video Codec	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP Encoder: MPEG-4 SP, H.264 BP, H.263	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP Encoder: MPEG-4 SP, H.264 BP, H.263
Ethernet	Chipset	Freescale i.MX6 integrated RGMII	Freescale i.MX6 integrated RGMII
	Speed	1 x 10/100/1000 Mbps	1 x 10/100/1000 Mbps
RTC		Yes	Yes
WatchDog Timer		Yes	Yes
I/O	USB	1 USB 2.0	1 USB 2.0
	Audio	1 x Line-out	-
	SPDIF	-	-
	SDIO	1 x SD slot	1 x SD slot
	Serial Port	1 x 4 wire UART	-
	Button	1 Reset button	1 Reset button
Indicator	LED	2 Green LED for system power and RF status	1 Green LED for system power
Expansion	SD Socket	1 x SD slot	1 x SD slot
Power	Power Supply Voltage	12 V	9~24 V
	Power Type	DC-in	DC-in
	Power Consumption	2.3 Watts	3 Watts
Environment	Operational Temperature	0 ~ 40° C	0 ~ 60° C/ -20 ~ 70° C
	Operating Humidity	5%~95% Relative Humidity, non-condensing	5%~95% Relative Humidity, non-condensing
Mechanical	Dimensions (W x D)	191 x 129 x 30 mm with metal plate 166 x 117 x 30 mm without metal plate	108 x 79 x 30 mm
	Mounting	Wall mount, VESA 75/100, Flexible mount with two screw holes on the metal plate	Wall mount, DIN Rail
	Weight	265g	312g
Operating System		Linux v3.035/ Android 4.2	Linux Kernel v3.0.35
Certifications		CE/FCC Class B	CE/FCC Class B

RISC Core Architecture Development

IC PARTNERS	FIRMWARE	OS	DRIVERS	CODECs	FRAMEWORKS
freescale Texas Instruments	▪ MTD ▪ Bootloader ▪ SoC Code	Windows Embedded android Linux	▪ System Management (RTC, WDT, Power…) ▪ Peripherals (USB, SATA, Touch…) ▪ Video Interface (LVDS, HDMI, VGA...) ▪ Communication (LAN, Wi-Fi, UART)	▪ H.264 ▪ H.263 ▪ MPEG-4 ▪ MPEG-2 ▪ MPEG-1	▪ Multimedia API ▪ GUI (Embedded QT) ▪ Networking communication

Regional Service & Customization Centers

China
Kunshan
86-512-5777-5666

Taiwan
Taipei
886-2-2792-7818

Netherlands
Eindhoven
31-40-267-7000

Poland
Warsaw
48-22-33-23-740 / 741

USA
Milpitas, CA
1-408-519-3898

Worldwide Offices

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Beijing	86-10-6298-4346
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Shenzhen	86-755-8212-4222
Chengdu	86-28-8545-0198
Hong Kong	852-2720-5118
Taiwan	0800-777-111
Rueiguang	886-2-2792-7818
Yang Guang	886-2-2792-7818
Xindian	886-2-2218-4567
Taichung	886-4-2378-6250
Kaohsiung	886-7-229-3600

Asia Pacific

Japan	0800-500-1055
Tokyo	81-3-6802-1021
Osaka	81-6-6267-1887
Korea	080-363-9494
Seoul	82-2-3663-9494
Singapore	
Singapore	65-6442-1000
Malaysia	1800-88-1809
Kuala Lumpur	60-3-7724-3555
Penang	60-4-397-3788
	60-4-397-4188
Indonesia	
Jakarta	62-21-769-0525
Thailand	
Bangkok	66-2-248-3140
India	1800-425-5070
Bangalore	91-80-25450206
Australia	1300-308-531
Melbourne	61-3-9797-0100
Sydney	61-2-9476-9300

Europe

Europe	00800-2426-8080
Germany	
Münich	49-89-12599-0
Hilden	49-2103-97-885-0
France	
Paris	33-1-4119-4666
Italy	
Milano	39-02-9544-961
Benelux & Nordics	
Breda	31-76-5233-100
UK	
Reading	44-0118-929-4540
Poland	
Warsaw	48-22-33-23-740/741
Russia	8-800-555-01-50
Moscow	7-495-232-1692

Americas

North America	1-800-866-6008
	1-888-576-9668
Cincinnati	1-513-742-8895
Milpitas	1-408-519-3898
Irvine	1-949-420-2500
South America	
Mexico	52-55-6275-2777
Brazil	0800-770-5355
São Paulo	55-11-5592-5355

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